

The Author



1. TITLE PAGE

*Ranger Ryan's
Concise Guide
to Special Forces Electronic Communications*

SECOND EDITION
APRIL 1985

NO FORN DISSEM NO CLASS. INFO
ALTHOUGH THIS DOCUMENT CONTAINS NO CLASSIFIED
MATERIAL, IT IS TO BE TREATED AT ALL
TIMES AS THOUGH

CONFIDENTIAL

THE CRITICS RAVE!!!

"This blockbuster stands tall with From Here to Eternity, the Five Fingers, and the King James Bible as a real man's reading experience."

-Soldier of Fortune

"A pretentious diatribe that offends the soul, mutilates accepted morality, and pontificates the senses . . . RANGER RYAN is obviously neo-reactionary and crypto-fascist."

-Harpers

"With unflinching panache and verve, plus a "haute couture" style that swoops from crisply cynical to downright voluptuous, RANGER RYAN is a sumptuous page-turner."

-Cosmopolitan

"... Obviously funded with secret right-wing hate money funneled directly from the Pentagon."

-The Guardian

АНГІР РYАН МЮСТ ДИИ!"

-Pravda

2. INTRODUCTION

This document is not meant to turn you into a fully qualified 31V3S; only years of hard study and practical experience by a human possessed of high intellect, phenomenal patience and true grit can forge a true commo man. But, armed with this manual, the individual should be able to initiate and sustain electronic communications between his detachment and Base Station.

3. TABLE OF CONTENTS

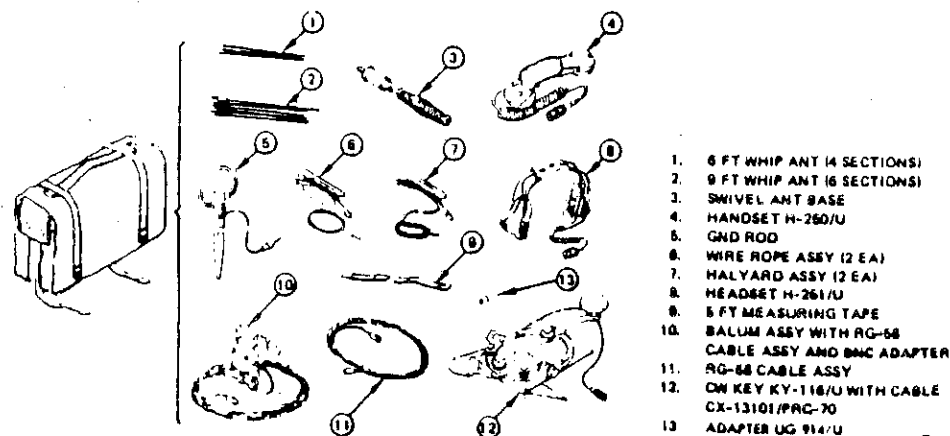
1. TITLE PAGE	1	5. OPERATING IN THE FIELD	22
2. INTRODUCTION	2	A. Those Damn Pads	22
3. TABLE OF CONTENTS	2	B. Message Preparation	23
4. TOOLS OF THE TRADE	3	C. Receiving a Message	26
A. AN/PRC-70 Accessory Bag	3	D. Sending a Message	31
B. Common Antennas	4	6. ATTACHMENTS	37
C. Urban Antennas	8	A. S.F. Det. Equip. Chart	37
D. AN/PRC-70 Radio	13	B. Message Formats	38
E. Digital Msg. Dev. Gp.	16	C. Trigraph	44
F. Batteries and Generator	19	D. World Time Zone Map	45
G. Power Supply	21	E. World Time Freq. Stat.	46
H. Maintenance	21	F. Precautions Against RDP	47
		G. Morse Code Chart	48



4. TOOLS OF THE TRADE

A. AN/PRC-70 Kitbag

There's nothing here that shouldn't be familiar except for components 11 and 13. Leave them behind; you won't need them. Also, add a 50' tape measure and some lead sinkers to the bag.



B.Common Antennas

1)Antenna Length- The first table below will indicate the proper antenna for each mode and frequency. The second table gives the transmitting range of each mode while using the doublet(AS-2975).

To calculate the total length in feet of both the doublet and slant antennas, divide the frequency in MHz into 468. For example, if the frequency is 5.820MHz, the total length of the antenna will be 80.4 ft.

$$\begin{array}{r} 80.4 \\ 5.820 \overline{)4680000} \\ \underline{4656} \\ 24000 \\ \underline{23280} \end{array}$$

Operating Modes, Antennas, and Frequencies

Operating Mode	Antenna	Frequency
FM	6-foot whip	30 to 76 MHz
	9-foot whip	30 to 76 MHz
CW, FSK, AM, SSB	6-foot whip	4 to 76 MHz
	9-foot whip	3 to 76 MHz
	Doublet	2 to 30 MHz (normal)

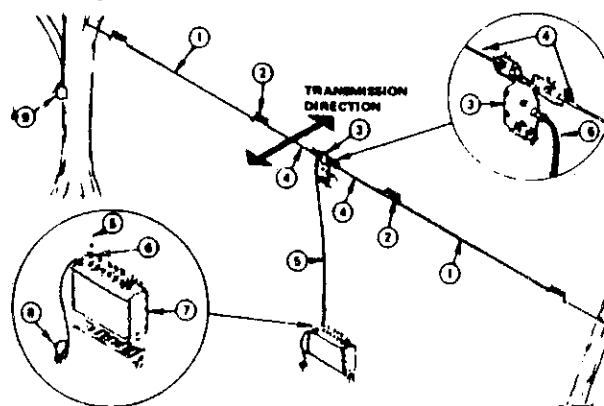
Operating Modes, Antennas, and Distances

Mode	Antenna	Distance Range
CW	AS-2975/PRC-70	Up to 2,500 miles*
SSB Voice, AM	AS-2976/PRC-70	0-500 miles
SSB Voice, FM	AS-2974/PRC-70	0-25 miles
AM	AS-2974/PRC-70	0-15 miles
FM	AS-2974/PRC-70	0-15 miles

*Long wire antenna may be used

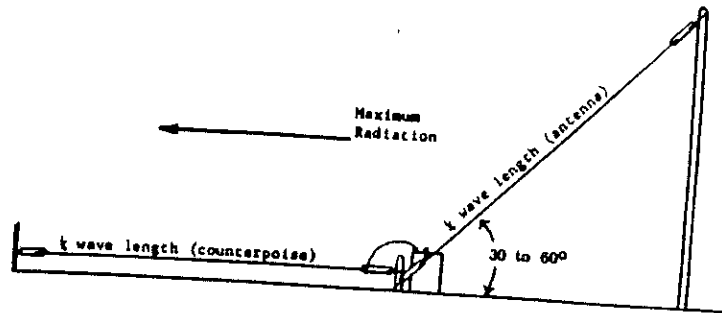


2)Doublet Antenna- Get this broadside antenna as high as possible. If you can, make the center of the dipole slightly higher than the ends. Always make sure the two legs are exactly the same length.

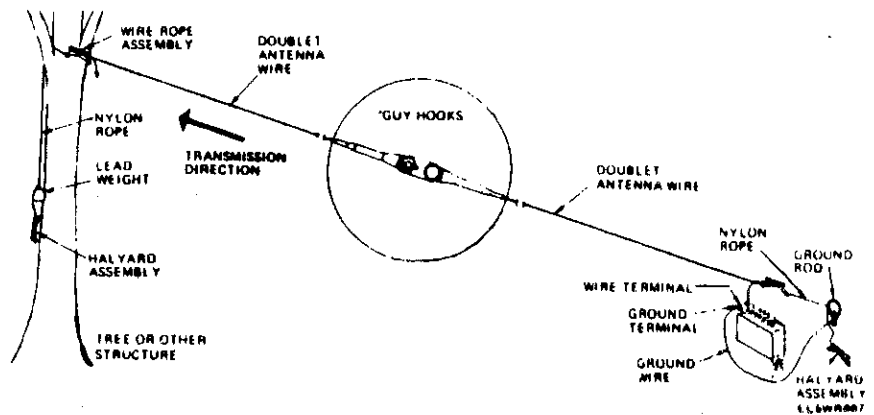


1. HALYARD ASSY
2. WIRE ROPE ASSY
3. BALUN ASSY
4. ANTENNA WIRE
5. RG-58 CABLE ASSY
6. ANTENNA CONN
7. RT UNIT
8. GROUND ROD
9. LEAD WEIGHT

3) Slant Wire Antenna- Put the end up as far up the tree as you can. Make every effort to set up your antenna in an open area with dry ground underneath. Trees and wet ground will absorb your signal.

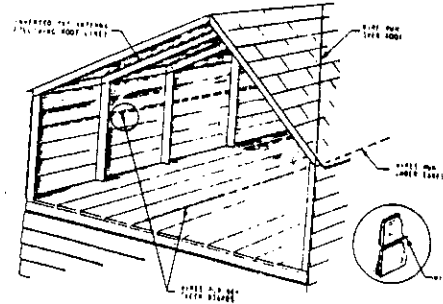
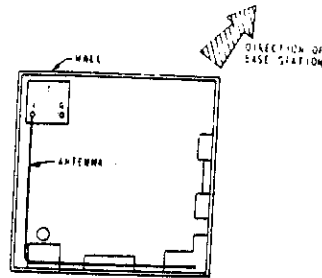


4) Long Wire Antenna- The total length will be 234 ft. Use your compass carefully to align the antenna perfectly toward the Base Station. An error of only 2 or 3 degrees can well mean the difference between making commo or not.

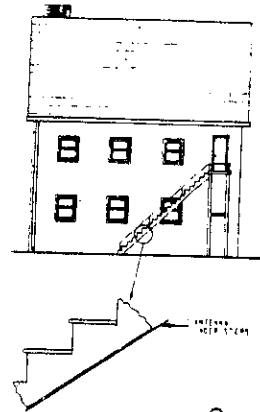
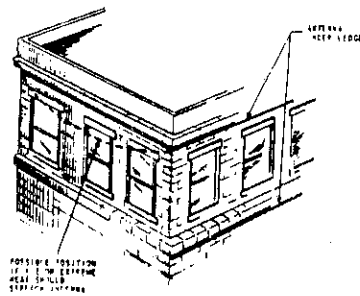
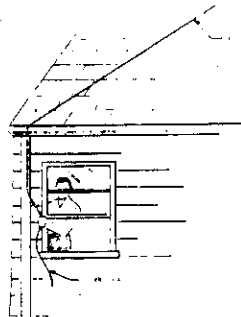


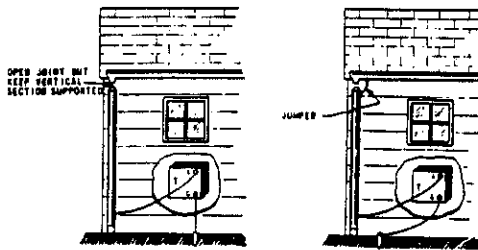
C. Urban Antennas

Urban electronic communications should bring out the happy inventiveness in the enthusiastic S.F. trooper. Just follow a few simple guidelines and apply a little common-sense caution. If possible, occupy the highest room closest towards the Base Station that's also clear of other taller structures. Avoid buildings constructed with metal walls, reinforced concrete, and plaster with metal lath. Wood, thatch, brick, cement block, tile and plaster building material do not seriously attenuate radio signals. Metal lath can be detected by either cutting a hole in the wall or sliding a magnet or compass along the wall.



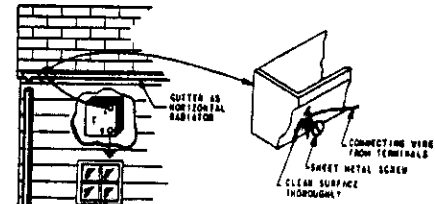
Try receiving first at your preliminary site. In general, a location which is poor for receiving will also be poor for transmitting signals. Any large mass of metal can be used for grounding. Typical makeshift grounds include bed springs, file cabinets, air conditioning or heating ducts, or cold water piping.



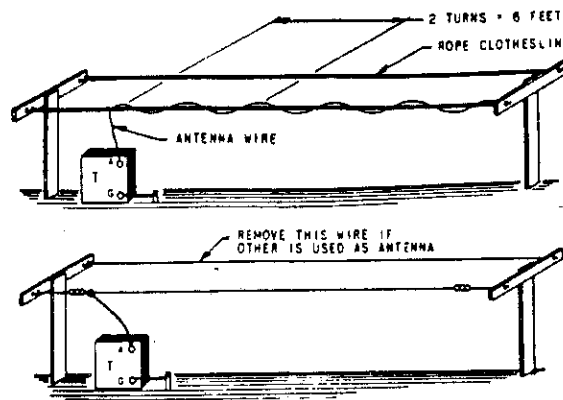


Select indoor locations where noise from buses, structures, or cars is not present. Avoid locations near service equipment such as elevators, oil burner motors, and pumps which create electrical sparking noise.

Think seriously about concealment. DO NOT run an antenna near a window unless investigations indicate that it cannot be seen from the outside. DO NOT leave an antenna in an area which is subject to periodic maintenance. Try to hide the antennas inside moldings and trim, or along drapes, pictures, or other wall ornaments.



10



As shown, you can utilize a clothesline in several different ways.

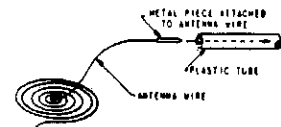
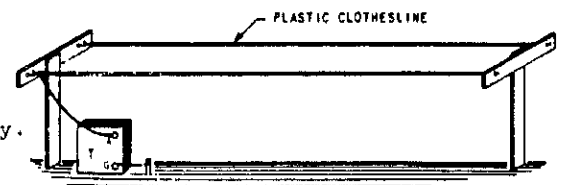


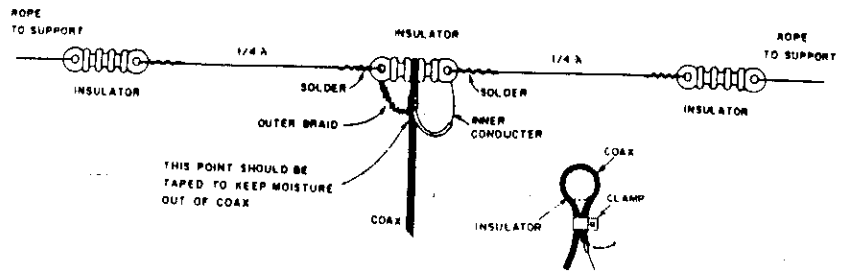
Figure B-16

Always realize that the enemy is looking for you, and the least bit of overconfidence, neglect, or presumption will have you breakdancing with a cattle prod ere' the sun comes down. Check Page 47 for some more tips on urban commo security.



11

If you ever have to abandon your antennas, never fear, just steal some coax cable and insulators to make your own. To connect the coax to the center insulator, cut a few inches of the outer covering off the coax. Next, separate the copper braid from the inner conductor and insulation. After you've done that, twist the strands of copper together to form a single wire. Remove about half the insulation covering the inner conductor

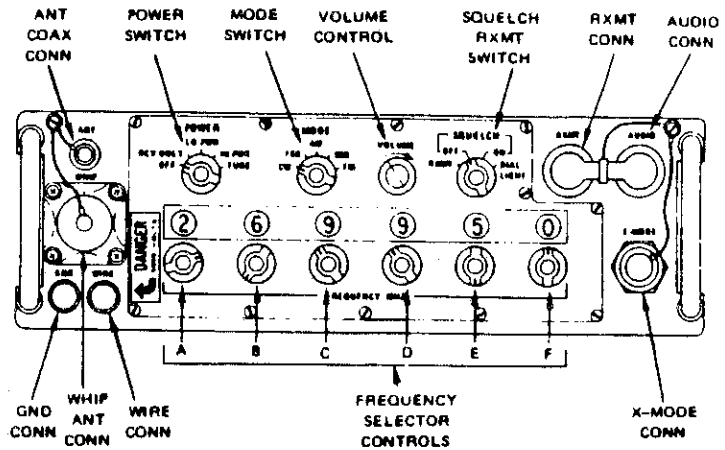


and bend it away from the twisted strands of copper braid. Loop the cable over the insulator as shown and solder the braid to one half of the antenna and the inner conductor to the other. Be sure to tape all connections securely for waterproofing; the braid can soak up water like a sponge or wick, making the coax useless after a while.

12

D. AN/PRC-70 Radio

This radio is powerful, heavy, sturdy, simple to operate, and has a frequency choice of 2 to 76 MHz. All of its controls should be familiar to the SF team member.



13

1) Starting and Receiving- Ensuring that the POWER switch is in the OFF position, attach radio to a charged battery. Hook up a proper antenna. Set the assigned receive frequency. Ensure SQUELCH switch is OFF. Connect headset to the AUDIO CONN terminal. Turn POWER switch to RCV ONLY. The radio will automatically tune itself to receive. To check battery power, turn the DIAL LIGHT while turning FREQUENCY SELECTOR CONTROL "B". If the light dims or flickers, the battery is low. If so, change the battery. Otherwise, return SQUELCH switch to OFF, put on headsets, adjust the VOLUME and listen.

2) Transmitting- Repeat the Starting and Receiving procedure (except you now set the assigned transmit freq.). Momentarily set RT unit POWER switch to TUNE and release. Allow 10 seconds for tuning to be completed (when TUNE tone disappears from headset). If it won't tune change antenna and try again. When tuned, turn POWER switch to LOW PWR (3 watts) or HIGH PWR (30 watts) as the situation dictates.

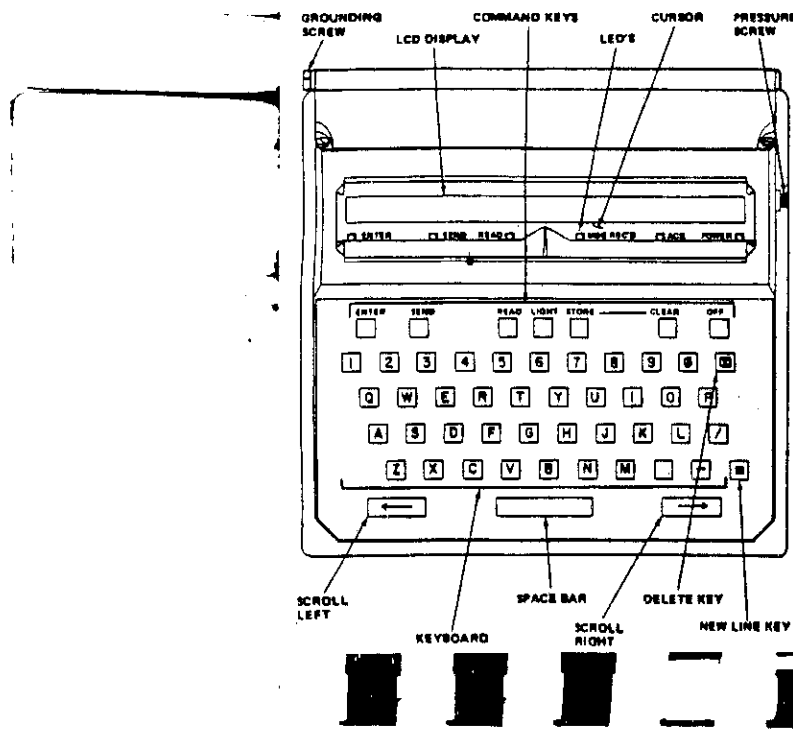
14

- a) For VOICE, hook up handset and set to AM, FM, or SSB.
- b) For MORSE CODE, hook up CW KEY and set to CW.
- c) For the CW BURST Mode, see Pages 31-36.

3) Operating Notes-

- *Never, EVER tune the radio to transmit when it's within 50 ft. of another operating radio; it will burn out the other radio (See Radio Price, Page 37).
- *Get into the habit of avoiding both the left side of the radio and the antennas. When transmitting, they will burn the hell out of you.
- *Do not change radio controls while transmitting (See Page 37 again).
- *If the X-MODE CONN cover is off, the radio will not work.
- *Clean all connectors with an eraser before a contact.
- *While receiving, you may have to turn FREQUENCY SELECTOR SWITCHES "F" and "E" a few notches to bring in a clearer signal.

15



E. Digital Message Device Group

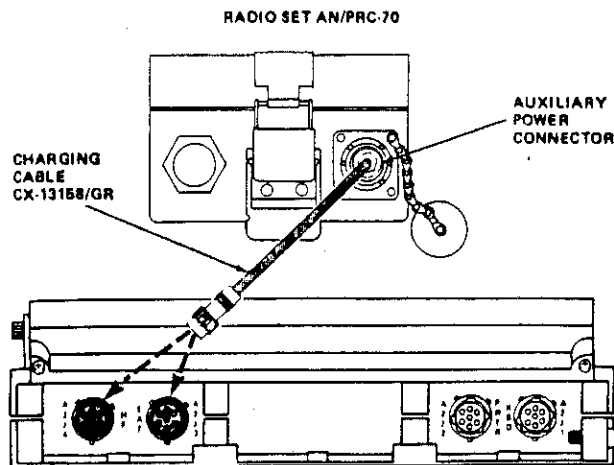
1) General Operation- A message is typed into the device at the keyboard, displayed and put into the transmit memory. When sending, the operator selects the proper mode of operation and presses the appropriate keys on the keyboard. The entire message is sent to the radio and sent at 300 GPM. At the receiving station the message is received by the radio set and transmitted to the device receive memory. The message is then ready to be recalled and read on the display screen.

2) To Enter Message- Press ENTER key twice. Press "1" then "=". Type in encrypted message (see Pages 23-25). If you have more than one message either in the memory or to be inserted, just run the messages one right after the other. Keep in mind that the Transmit Memory stores a maximum of 1000 characters, or enough for about 5 thirty group messages. To correct a mistake, press the SCROLL LEFT or SCROLL RIGHT until the error is over the CURSOR mark. To delete a character or space, press "X". To add a character, simply press the character key. To continue typing, press SCROLL LEFT until the last character is to the left of the CURSOR. Once finished, press the OFF key. Transmitting and receiving messages will be covered in Section 5.

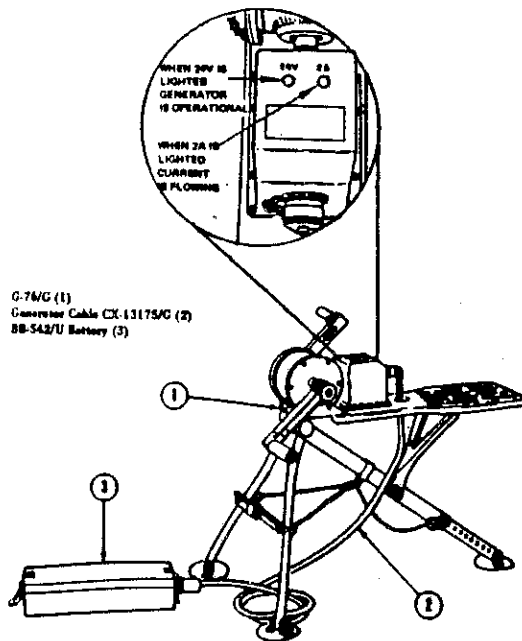
3) Operating Notes-

- *Water pressure past 3 ft. will crack the display screen.
- *When turned on, the device will automatically test itself and indicate on the screen if it is ready for operation or requires maintenance action.
- *Pressing the LIGHT button turns on the light for the display screen. The display will stay lit for 10 seconds after the last key is pressed.

4) To Charge Device- A fully charged Device will provide about 4 hours of use. When the red POWER light begins to blink, the internal battery is almost exhausted. To recharge, simply hook up the Device as shown. The red POWER light will come on and the screen will display SELF TEST COMPLETE UNIT OK. An exhausted Device will take about 2 hours, and about one-half of a battery's power, to recharge. When charged, the red light will go out. Disconnect the cable and turn the Device off.



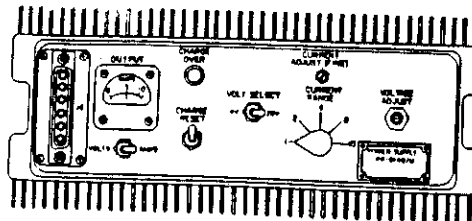
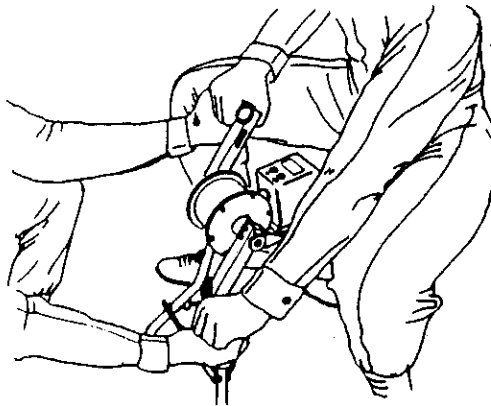
G-76/G (1)
Generator Cable CX-13175/G (2)
BB-542/U Battery (3)



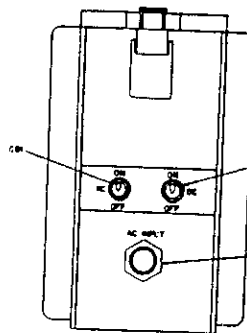
F. Batteries (BB-542/U) and Generator (G-76/g)- With an average of four receive and send contacts a day, each battery should last 3-4 days. Conserve battery power by sending on low power, tune sparingly, and keep batteries in a warm place. When they run too low a breaker will trip in the battery and your radio will die instantly.

To recharge the battery, first insure that the battery circuits are closed, then hook to generator as shown. Crank between 70-100 RPM (or the 24V light will go out) for about 40 minutes non-stop. When the 2A light goes out and the generator turns effortlessly, the battery is charged.

To sustain this high rate, buddy up as shown in the illustration. The colder the weather, the longer it will take to recharge. Keep the battery in a heated area if possible. Wrap the battery in a blanket or sleeping bag. Crank as fast as possible. Even then, if it's below freezing, it will probably take 50 or 60 minutes to recharge. Hey, life's a bitch.



TOP VIEW



LEFT SIDE VIEW

Power Supply (PP-4148). By this time, you've probably noted the wisdom of charging your batteries back in garrison. After ensuring the circuit is closed, hook up the battery to the Power Supply Cable. Set the VOLT SELECT switch to 20V and the CURRENT RANGE switch to 1. Ensuring that both the AC and DC switches are off, hook up the AC Power Input cable to the Power Supply and plug into a wall socket. Turn on the AC switch. Adjust the VOLTAGE ADJUST control slowly until the yellow light comes on. Turn on the DC switch. Flick the CHARGE SELECT switch once. You should hear a distinct humming noise. While holding the VOLTS/AMPS switch to AMPS, adjust the CURRENT ADJUST control until the OUTPUT dial reads "1.0". Release the VOLTS/AMPS switch. Charging should take no longer than 90 minutes.

H. Maintenance- Maintenance is easy. Keep the equipment dry and accounted for. Clean and test each drill. Keep it charged. Don't drop or kick it. When out of the field, inventory and then clean with a cloth and brush. Inspect all parts carefully. If anything is worn, broke, or lost, write and turn in the appropriate paperwork immediately.

5. OPERATING IN THE FIELD

- A. Those Damn Pads- a quick reference to the paperwork involved:
- 1) CEOI- A fat little white book, part of which details your transmit and receive times, callsigns, days and frequencies for a 31 day period. The rest is a "Commo Bible"; a reference to supplement your commo skills in the field.
 - 2) ARTEMIS- A one-time pad cryptosystem with identical encypher and decypher (send and receive) books to pass traffic between you and the base station. Each page has 20 groups plus a Pad Page Indicator (PPI) at the top right corner.
 - 3) DIANA- A one-time pad cryptosystem identical to ARTEMIS except each pad has 30 groups and no PPI. Both ARTEMIS and DIANA come in yellow and blue sealed pads of 100 pages each. You will only use one of these systems in the field.
 - 4) Frequency Cypher Pad (FCPs)- A small square green one-time pad used to decrypt your scheduled transmit freq. plus the acknowledgement of your transmission.
 - 5) DYRAD- A white booklet used to decrypt the Open Net freq. Each booklet is for a 31 day period, and because it is shared by all the deployed teams, it is not as secure as the scheduled net.



B. Message Preparation

ARTEMIS Pad Page

01				THIRP (PPI)
ONE TO EIGHT COULD	SANDY EIGHT NIGHT	THREE EIGHT EIGHT	FOUR EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	
SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	SIXTH EIGHT EIGHT	

1) Writing a Message- You are in the field and you have to send a message. Break out your CEOI and your Encypher pad. Look up the Message Format you require (Pages 38-43); in this example, an Initial Entry Report (ANGUS). Using the first clean page in your Encypher pad, underline the Pad Page Indicator (PPI). Starting with your next group begin filling out your message above the 5-letter groups in sequence, carefully following the Message Format instructions and examples. Periodically stop and check your work. Finish out the last group with "X's" and then cross out the next group and replace it with the PPI.

DIANA Pad Page

02 (PPI)				
FLICK	SIXTH EIGHT EIGHT	SANDY EIGHT NIGHT	THREE EIGHT EIGHT	FOUR EIGHT EIGHT
WICKS	SIXTH EIGHT EIGHT	SANDY EIGHT NIGHT	THREE EIGHT EIGHT	FOUR EIGHT EIGHT
KOROS	SIXTH EIGHT EIGHT	SANDY EIGHT NIGHT	THREE EIGHT EIGHT	FOUR EIGHT EIGHT
SIXTH	SIXTH EIGHT EIGHT	SANDY EIGHT NIGHT	THREE EIGHT EIGHT	FOUR EIGHT EIGHT
JUPES	SIXTH EIGHT EIGHT	SANDY EIGHT NIGHT	THREE EIGHT EIGHT	FOUR EIGHT EIGHT

2) Message Encryption- With your Trigraph in hand (Page 44) take the first letter in your message (O) and locate it on the alphabet running down the right side of the graph. Take the pad letter (H) beneath that message letter and locate it on the alphabet running to the right of the Trigraph "O" column. Write the letter that's beneath it, which is an "E", under the "H" on the pad. Repeat process for all the letters. DO NOT ENCRYPT THE PPI's!! Add your transmit callsign (from the CEOI), the group count, a couple breaks (BT) and an out(AR) and the message is ready to be entered into your Digital Message Device Group:

C7X GROUP COUNT ONE NINE BT
THYOP EQCMQ HZWEI OQCHD KYRNE EVBYL
UFXYJ QPBBV DGJTE HPSJT ZBDQH RVNRX
JGXMO DBRPZ HCHC XAZVT UHFPA RHGOG
THYOP BT AR



3) Operating Notes-

- *Double check all of your work; there will be mistakes every time.
- *Write clearly and carefully.
- *All commas and periods will be represented by "XX".
- *When words or phrases need to be repeated for clarity or emphasis, include "XXX" after it and then repeat it.
- *Numerals will be spelled digit by digit.
- *Only one word will ever be abbreviated: Roger (RGR).
- *Use different colored pens or pencils to write the message and encrypt it.
- *Keep a log of all contacts, and the contents of all messages sent and received.
- *Memorize the Trigraph (Page 44); it will save you a great deal of time.

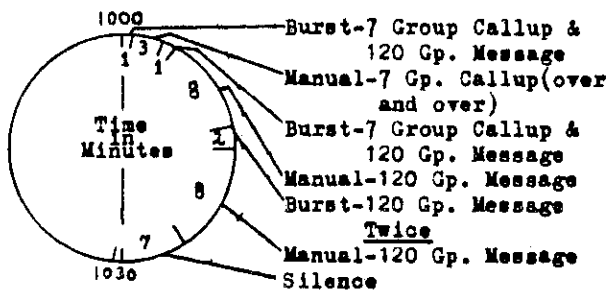
C.Receiving a Message

1)Time Checks and Zulu Time-Before your contact time take a few minutes to get an exact time check on your radio. I have included some of the time/information stations plus their frequencies on Page 46. The two most useful are WWV and WWVH. The easy way to determine which of these two stations you are listening to, since the same frequencies are used in several cases, is to remember that WWV has a male voice and WWVH does not.

All of the times in your CEOI are in Zulu time. I have included a World Time Zone Map (Page 45), but it's so damn confusing that I usually sit with the Base Station people before insertion and we both convert the times to the time zone I'm to be operating in. While I'm at it, I also triple-check all the frequencies, callsigns, etc. with them also. It's too late to to ask questions or have second thoughts out in the boonies.

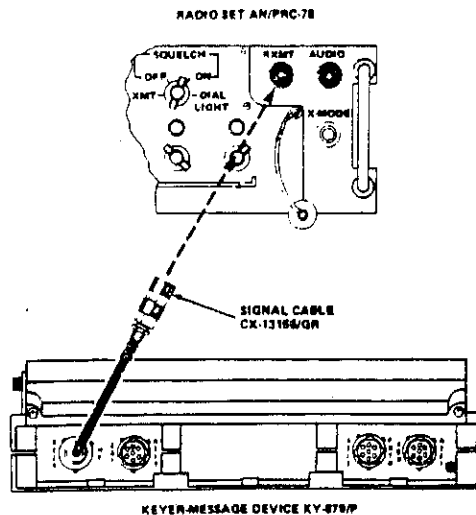


2)Base Blind Transmission Broadcast Format (BTB)- Long before the teams are deployed, the base station begins to transmit a standard format in 30 minute recurring periods, 24 hours a day, until some time after the last team has left the field. As a result, the enemy, which will probably pick up their transmissions anyway, is flooded with traffic, most of which is dummy. The outstations, with their scheduled contact times, know which is authentic. The format/schedule for each 30 minute period is shown below.



3)Receiving Your BTB- Find your next scheduled receive time in your CEOI. A few minutes before your contact, set up your radio as described on Pages 14-15 plus turn MODE switch to SSB. Hook up your Device

to your AN/PRC-70 as shown. Turn the Device on. Make sure the Receive Memory is cleared. On the half hour, you will hear the Base Station transmitting your message on the headset. The Device screen will read, "MESSAGE BEING RECEIVED," then "MESSAGE BEING PROCESSED," then "RECEIVED MESSAGE IN MEMORY." Press READ key. Read your message by pressing the SCROLL LEFT bar.



28

4)A typical Message and the Components

7 Group Callup

43	QRA DE ASU	MSDFU	GHEBI	DRCBX	CDYCT	XBCBS	DICGX	MSDFU	AR
UNIT	ADDRESS	PPI	OPEN NET FREQ				PPI	OUT	
BASE CALLSIGN		ACKNOWLEDGEMENT				SCHEDULED NET FREQ			

120 Group Message Heading

QRA DE ASU	NR 3	-P-	041500Z	MAY 84	GR 120	BT
BASE CALLSIGN	PRECEDENCE	MONTH/YEAR		BREAK		
MSG NUMBER		DATETIME GROUP		GROUP COUNT		

120 Group Message

MIKE	SIERRA	DELTA	FOXTROT	UNIFORM	ZCECA	UPQNJ	MSDFU	BT	AR
PPI PHONETICALLY SPELLED					THE OTHER 114 GROUPS			PPI BREAK OUT		

29

5) Breaking Out Your Message- Pull out your Decypher Pad and check if the message PPI is on the PPI list in the frmt. If not, ignore the message and shut down; it's a dummy. If it is listed, insure you get a good copy. If the Base Station Address Number has an "E" in front of it (Example=E43), that means there are errors in the message--maybe a few, maybe many--indicated by numbers and nonsense symbols in place of the letters. In that case, receive the next burst too, and the next, until you get two decent copies. Keep in mind though, that the Receive Memory can only hold two 120 group messages at a time . . you may have to erase a poor copy during the contact. If need be, hand copy the two manual transmissions, too (See Page 48). Now locate the PPI pages in your Decrypt Pad, enter the encrypted message above the 5-letter groups and begin decrypting (See Page 24). The message may run through several pages in your pad; when you decrypt a series of "X's", that should mark the end.

30

D. Sending a Message

1) The 7 Group Callup- Find your next transmit contact in your CEOI. Enter your encrypted message(s) in your Device as detailed on Pages 16-17 and 24. Prepare your radio as detailed on Pages 14-15, plus turn MODE switch to SSB. Hook up your Device as shown on Page 28. Turn it on. On the half hour beginning the receive period, the Base Station will send the BTB standard format (Page 27). You are only concerned with the first five minutes; that is, the two bursts and the manual three minute callup. From these, you must glean at least one complete seven group callup. For example:

QRA DE A8U

MSDFU GEMEI DRGBX CDICT XBCBS DXCGX MSDFU MSDFU AR

31

2) Using the FCP's Pad- Open the front of your FCP's Pad and find Group #5 of the 7 Group Callup in the FCP's list. Turn to the proper page, which should have Group #5 at the top left corner. Fill

XBCBS												
	9	8	7	6	5	4	3	2	1	0	-	
D	U	V	W	X	Y	Z	A	B	C	D	E	O
X	S	T	U	V	W	X	Y	Z	A	B	C	4
C	B	C	D	E	F	G	H	I	J	K	L	P
G	C	D	E	F	G	H	I	J	K	L	M	5
X	N	O	P	Q	R	S	T	U	V	W	X	O

in Group #6 of the 7 Group Callup in the left column. Match the numbers overhead to the Group #6 letters and enter in the right column (D=0, X=4, C=8, G=5, X=0). This is your scheduled transmit frequency for that half hour (4.850MHz). Frantically recut your transmit antenna to that frequency (Page 4). When complete, put the new frequency on the radio and retune (Page 14).

32



3) Transmitting and the Acknowledgement-Press SEND key on the Device. Enter the two numeral Base Station Address. At the proper second press "=". Display will read MESSAGE BEING TRANSMITTED, then MESSAGE TRANSMITTED. Wait 50 seconds. Repeat procedure. To receive the Base Station Acknowledgement for your transmission, hook the radio back to the receive antenna, switch the freq. back to the receive freq., and change the MODE back to RCV ONLY. At the next half hour contact copy the 7 Group Callup. Take Group #2 (Example=KZPVC) and enter it in the column below Group #6 on the same FCP's Pad page you got the transmit freq. from. Break it out as before and apply it to the charts below.

XBCBS												
	9	8	7	6	5	4	3	2	1	0	-	
D	U	V	W	X	Y	Z	A	B	C	D	E	O
X	S	T	U	V	W	X	Y	Z	A	B	C	4
C	B	C	D	E	F	G	H	I	J	K	L	P
G	C	D	E	F	G	H	I	J	K	L	M	5
X	N	O	P	Q	R	S	T	U	V	W	X	O

- (a) The first letter of the second group indicates:
1. Yes, the burst was received and is breakable
 2. No, the burst is not breakable.
 3. No transmission was heard.
- (b) The second letter of the second group indicates:
1. Poor spacing, retape.
 2. Keyer malfunction.
 3. Tape sticking.
 4. PPT missing/incorrect.
 5. Re-encrypt.
 6. Signal fading.
 7. Signal overridden.
 8. No problem.
 9. Not heard.

33

3 4

QRA DE ASU MSDFU GHMEI DRCEX CDXCT XCBES DXCGX MSDFU MSDFU AR

	17									
	1	2	3	4	5	6	7	8	9	0
A	OJ	IC	MP	VRW	DAP	SK	LTX	EN	GZU	YRHQ
B	OT	EG	IN	UPA	QVJ	BK	CTE	ZL	EXD	MFSW
C	GQ	AP	ER	ZBF	JSI	YE	LXX	DU	WMN	OVCT
D	FN	EV	MD	LUX	TEC	BZ	PWO	XQ	GVE	AJIS

4) The Open Net and DYRAD- The Open Net allows your to transmit anytime. To obtain the transmit frequency, copy any 7 Group Callup and extract the first two characters of Group #3 (DR). Open your DYRAD Pad to the page with that month's day up in the right hand corner (Example: Day 17). Locate the "D" on the right side until you reach the "R". The character to the right of the "R" will be the frequency row identifier ("C"). Take the 5 characters from Group #4 of the 7 Group Callup (CDXCT) and write out the number over each letter in Row "C" in sequence (C=0, D=8, X=7, C=0, T=0). The transmit frequency will be 8.700MHz. Transmit using normal outstation procedure in the Burst CW mode.



5) Operating Notes-

- *Whether on the Scheduled or Open Net, you can only transmit from the 5 minute to the 20 minute segment of the half hour window.
- *The Device cannot receive a message when you are transmitting.
- *The Device will not accept a "00" unit address or any address beginning or ending with the numbers 8 or 9, so there is a maximum of 63 addresses.
- *The Device will send all the messages in the transmit memory when the "■" key is pressed.

6) Transmission Security-

- *Burn all one-time pads after you record the messages, both sent and received.
- *Clear the Receive and Transmit Memory after messages are recorded and send by pressing both the STORE and CLEAR keys at once. Keep in mind that this act will clear all the Transmit Memory at once, but will clear only one message at a time in the receive memory.
- *Avoid long and unnecessary testing transmissions.
- *Operate radios at lowest power that will give satisfactory commo.
- *Adhere to the authorized transmission procedures in the CEOI.

7)Emergencies-In a real-world emergency, get on the radio and find a frequency that has some traffic on it. Cut in on HIGH POWER by saying "Any station, any station, this is an Army operator. I have an emergency." Or, on morse code send "SOS SOS SOS DE ARMY ARMY ARMY." Somebody will answer.

Also, there are Ham Radio Operators on the air, world-wide, 24 hours a day just waiting to be of service. Here's some of their commonly used frequencies:

26.965 Mhz	27.035 Mhz	27.115 Mhz	27.185 Mhz
26.975 Mhz	27.055 Mhz	27.125 Mhz	27.205 Mhz
26.985 Mhz	<u>27.065 Mhz</u>	27.135 Mhz	27.215 Mhz
27.005 Mhz	27.075 Mhz	27.155 Mhz	27.225 Mhz
27.015 Mhz	27.085 Mhz	27.165 Mhz	
27.025 Mhz	27.105 Mhz	27.175 Mhz	

36



6.ATTACHMENTS

A.SPECIAL FORCES DETACHMENT

EQUIPMENT CHART

ITEM DESCRIPTION	QUANTITY	WEIGHT	SERIAL NO.	UNIT PRICE
Radio Set AN/PRC-70	2	20.5lb.		\$38,924.00
Digital Message Gp. Device OA-8990	2	9lb.		\$3,850.00
Generator, Direct Current G-76/G	1	13.5lb.		\$3,700.00
Battery Type BB-542/U	4	7lb.		\$845.00
Power Supply PP-6148/U	1	19.5lb.		\$5,260.00
Accessory Bags Complete	2	13lb.		Too Much

37

B. Message Formats

Initial Entry Report (ANGUS)

a. General - The Initial Entry Report (ANGUS) will be submitted as soon after the infiltration as possible. This report reflects to the Base the success of the infiltration and the initial situation.

b. Format:

Proword: ANGUS
Paragraph:

- Location (nearest 1000 meters).
- Casualties: Code name of personnel who are unable to continue the mission and status using code words listed below:
UNCLE - Killed in Action.
FROST - Wounded in action.
SPARK - Captured or Missing in Action.
- Was contact made with friendly elements?
- Strength of guerrilla force.
- Additional information.

c. Example: (ANGUS)

Message number 12

AAA BRAVO TANGO NINE FOUR EIGHT SIX
BBB NOMAD BROKEN LEG QUACK SPARK
CCC YES
DDD THREE ZERO ZERO
EEE OMITTED

Message Prepared for Encryption:

ONE TWO ANGUS XX AAA BRAVO TANGO NINE FOUR
EIGHT SIX BBB NOMAD BROKEN LEG XX QUACK SPARK
CCC YES DDD THREE ZERO ZERO

Spot Intelligence Report (BORIS)

a. General - The Spot Intelligence Report will be used to transmit intelligence between the outstations and the Base.

b. Format:

Proword: BORIS

Paragraph:

- Date/time group (when)
- Size/type of unit (who)
- Activity (what)
- Location (where)
- Personalities
- Source
- Evaluation
- Additional information

c. Example: (BORIS)

Message number 12

Paragraph:

AAA 160000Z JAN
BBB RIFLE COMPANY ESTIMATE 140 MEN
CCC MOVING SOUTHWEST ON FOOT
DDD BRAVO TANGO 763814
EEE AUXILIARY AGENT
FFF F-6
GGG UNIT BELIEVED TO BE FROM 105 REGT. WELL
H H H H TRAINED IN COUNTERINSURGENCY
HHH OMITTED

Message Prepared for Encryption:

ONE TWO BORIS XX AAA ONE SIX ZERO EIGHT ZERO
ZERO ZULU JANUARY BBB RIFLE COMPANY ESTIMATED
ONE FOUR ZERO MEN CCC MOVING SOUTHWEST ON
FOOT DDD BRAVO TANGO SEVEN SIX THREE EIGHT ONE
FOUR EEE AUXILIARY AGENT FFF FOXTRIF DASH SIX
GGG UNIT BELIEVED TO BE FROM SEVEN ZERO FIVE
REGIMENT XX WELL TRAINED IN COUNTER-
INSURGENCY

Situation Report (CYRIL)

a. General - This report may be submitted as often as may be deemed necessary by the outstation. A CYRIL will be submitted to the Base on a schedule established in isolation, and approved by the Base CDR.

b. Format:

Proword: CYRIL

Paragraph:

- Location of outstation(s) nearest 100 meters.
- Guerrilla strength.
- Major activities since last report (what, where and when). Include past PSYOPS and TACAIR results in this paragraph. Also include non-nuclear destructions of targets.
- Project major activities (what, where and when).
- Additional information.

NOTE: A full length description, but furnish sufficient detail to allow the formulation of support contingency plans at the Base.

c. Example: (CYRIL)

Message number 12

Paragraph:

AAA BRAVO TANGO SEVEN TWO SIX SEVEN
BBB FOUR ZERO ZERO
CCC BRIDGE BRAVO TANGO FIVE FIVE TWO SEVEN
ONE FIVE DESTROYED 140100Z JUL. COMPANY
SIZE TACTICAL TRAINING
DDD RAID SUPPLY DUMP BRAVO SIX SIX SEVEN
FIVE TWO ONE 282000Z JUL

Message Prepared for Encryption:

ONE TWO CYRIL XX AAA BRAVO TANGO SEVEN TWO
SIX SEVEN BBB FOUR ZERO ZERO CCC BRIDGE BRAVO
TANGO FIVE FIVE TWO SEVEN ONE FIVE DESTROYED
TWO FOUR ZERO ONE ZERO ZERO ZULU JULY XX
COMPANY SIZE TACTICS TRAINING DDD RAID SUPPLY
DUMP BRAVO TANGO SIX SIX SEVEN FIVE TWO ONE XX
TWO EIGHT TWO THREE ZERO ZERO ZULU JULY EEE
RECRUITING GOOD XX EXPECT FIVE ZERO WITHIN FOUR
WEEKS

Target Acquisition Report (LUNCH)

a. General - This report will be used by outstations to report major targets within their area of operations.

b. The Target Acq. Code WILL BE USED WHENEVER POSSIBLE TO MINIMIZE LENGTH.

c. Format:

Proword: LUNCH

Paragraph:

- Target Location.
- Target elements (within target brevity code).
- Target radius or size (report dimensions to nearest 100 meters).
- Distance to nearest friendly element (location designated by magnetic azimuth, type of element and distance from target).
- Recommended date/time of attack.
- Recommended delivery means (use brevity code). If the code word GANDY (recommending TACAIR strike) is used, a Tactical Air Support Mission Request (COVER) must be submitted with the Target Acquisition Report (LUNCH). If the code word WASHY is used and approved, a BLAST report will be received from the base.
- Additional information

d. Example: (LUNCH)

Message number 12

Paragraph:

AAA BRAVO TANGO NINE SIX TWO FIVE FOUR
THREE
BBB ROYAL
CCC 300 by 100 METERS LONG AXIS 178 DEGREES
DDD 240 DEGREES GRASP FOUR KILOMETERS
EEE 112200Z OCTOBER TO 142200Z OCTOBER
FFF FISHY

Message Prepared for Encryption:

ONE TWO LUNCH XX AAA BRAVO TANGO NINE SIX TWO
FIVE FOUR THREE BBB ROYAL CCC THREE ZERO ZERO
BY SEVEN ZERO ZERO LONG AXIS ONE SEVEN ZERO DDD
TWO SIX ZERO DEGREES GRASP FOUR KILOMETERS EEE
ONE TWO TWO TWO ZERO ZERO ZULU OCTOBER TO ONE
SIX TWO TWO ZERO ZERO ZULU OCTOBER FFF FISHY

DZ, LZ, RZ Report (GRAZE)

a. General—Proposed DZ's, LZ's, and RZ's will be surveyed and reported as soon as practicable during the course of operations by elements using the format below.

b. Format

Proword: GRAZE

Paragraph:

A. Code name and type. Use the following indicators for type.

- (1) TIGER—Personnel DZ
- (2) BRAVE—Resupply DZ
- (3) MOUSE—Water LZ
- (4) PLANK—Fixed Wing LZ
- (5) CAMEL—Rouly Wing LZ
- (6) RISER—Recovery Zone
- (7) * Select code names with five letters with no letters alike.

(8) Include the word "RESUP" after code name of DZ if DZ can only be used for resupply.

B. Location of DZ.

(1) Use complete military grid coordinates to nearest 100 meters of center of land DZ and latitude/longitude to nearest 100 yards of center for ocean DZ. For inland water DZ's grid coordinates will be used.

(2) If an area DZ is to be used, report the coordinates of both the limiting points to be used. Refer to FM 31-18 and AFM 3-5.

C. Reference point.

(1) Use landmark clearly shown on issued map or chart.

(2) Report reference point by magnetic azimuth description, and distance in kilometers from the center of DZ. (FM 21-29 and AFM 3-5).

D. Width, length, and long axis of DZ

(1) Report width and length in meters and long axis by magnetic azimuth.

E. Open quadrant.

(1) If open 360 degrees, report OPEN.

(2) Measure open quadrant from center of zone and report as a series of azimuths. The open quadrant indicates acceptable aircraft approaches.

(3) If an area DZ, omit this item.

F. Track.

(1) The track is the recommended magnetic azimuth on which the aircraft is to fly when executing the drop.

(2) Should circumstances dictate a required track, the symbol RQR will precede the azimuth (if not otherwise stated in follow-up message), the aircraft will fly the RQR track within 15° of either side of the track.

G. Obstacles

(1) Report by description, magnetic azimuth and distance from the center of the DZ any critical obstacles over 40 meters (100 FT) in height above the level of the DZ within a radius of 3 NM (9.3 KM) that are not shown on the issued map.

(2) If there are no obstacles, omit this item.

H. Additional information

c. Example: (GRAZE)

Message number 12

Paragraph:

AAA HELGA TIGER

BBB XRAY DELTA ONE FOUR NINE THREE EIGHT TWO

CCC ONE SEVEN TWO DEGREES MEDVILLE ONE TWO KILOMETERS

DDD SIX ZERO ZERO BY ONE TWO ZERO ZERO METER LONG AXIS ZERO FOUR TWO DEGREES

EEE ZERO ZERO FOUR DEGREES TO ZERO NINE SIX DEGREES AND ONE SEVEN NINE DEGREES

FFF ONE FOUR FIVE DEGREES

Message Prepared for Encryptions:

ONE TWO GRAZE XX AAA HELGA TIGER BBB XRAY DELTA ONE FOUR NINE THREE EIGHT TWO CCC ONE SEVEN TWO DEGREES MEDVILLE ONE TWO KILOMETERS DDD SIX ZERO ZERO BY ONE TWO ZERO ZERO METER LONG AXIS ZERO FOUR TWO DEGREES EEE ZERO ZERO FOUR DEGREES TO ZERO NINE SIX DEGREES AND ONE SEVEN NINE DEGREES TO SEVEN FIVE DEGREES FFF ONE FOUR FIVE DEGREES

Dental Identification System Report (MOLAR)

a. General:

(1) Same as the Fingerprint Data Report except that the Proword "MOLAR" is to be used rather than "PRINT".

(2) The Dental Identification System (MOLAR) is to be used as an additional means of identifying personnel or as the sole means of identification in the event fingerprints are missing or are completely illegible. Determination for use of MOLAR Report is to be made by the Field Elements. The Base should have means to obtain dental data from personnel if the case so requires.

b. Format:

Proword: MOLAR

Paragraph:

- A. Full name of individual (no abbreviations).
- B. Day, month, year of birth (use last two digits of year).
- C. Nationality.
- D. Branch of Service.
- E. Authenticator Question—Answer Repeat Answer.
- F. Authenticator Question—Answer Repeat Answer.
- G. Authenticator Question—Answer Repeat Answer.
- H. Authenticator Question—Answer Repeat Answer.
- I. Height in inches or centimeters (indicate) color eyes: color hair.
- J. Bloodchit number (repeat).
- K. Place of birth (city, state, country).
- L. Dental Identifier—Begin with ZZZ and end with ZZZ. Use Five consecutive teeth, either left/right/upper, or lower.

(1) Paragraphs ECHO through HOTEL are the CURRICULUM VITAE as it is described in the ACC-5 system from the FIS. The only difference in the above message is the MOLAR data. If no fingerprints are available this is the only means of identification with the CURRICULUM VITAE, and possibly could be the only manner to surface a plant or double agent.

(2) The reading of the dental identification of a person is commenced from top right to top left (teeth numbers 1-16) and from bottom left to bottom right (teeth numbers 17-32).

(3) TEETH CODES

Crown	PP
Filling	UU
Tooth Missing	VV
Fractured tooth	WW

No defect	YY
Bridge	ZZ
Denture	MM
Partial	KK

(4) MATERIAL CODES TO BE USED WITH THE TEETH

Stainless	QQ
Gold	RR
Porcelain	SS
Plastic	TT
Unknown	OO
Silver	NN

(5) Additional information that can be transmitted will be placed at the end of the message but prior to ending the ZZZZ: i.e., Partial Dentures from number _____ to number _____. Type Bridge, etc.

(6) Numbering the teeth will be spelled out, but a one digit number will have a zero before, i.e., The teeth numbers will always have two numbers; zero one, zero two, etc., One six, One seven, etc.

(7) The margin of ERROR in reading the teeth is TWO, for a positive identification and with the CURRICULUM VITAE. If doubt still persists, the field element can request another reading of the evaders teeth, and possibly request upper right, left, or lower left, right or center whichever the case might be. If the CURRICULUM VITAE questions have errors in them from the evader, a determination by the ground element has to be made and compared with the dental data. Base will have to be queried.

c. Example (PRINT)

Message number 12

E&E Initial Fingerprint Data Report (PRINT)

a. General:

(1) The E&E Initial Fingerprint Data Report will be used by the Base to transmit fingerprint data to the outstation or vice versa.
 (2) In compiling fingerprint data, a pattern and ridge count for all ten fingers will be taken. A "ZERO" ridge count will be indicated for all arches, tented arches, loops and whorls which are so mutilated that a ridge count is not possible.
 (3) All fingerprint data compiled will be converted to proper code indicators prior to encryption for transmission. The EEFI's Brevity Code will be used for this purpose.

b. Format

Proword: PRINT
 Paragraph:

- A. Full name of individual (do not abbreviate, use initials only if individual uses initial alone. If initials alone are used, repeat 3 times in message text).
 B. Date of birth (use only last 2 numbers of year in message text).
 C. Nationality of visitor.
 D. Branch of service if applicable.
 E. Authenticator question, answer REPEAT answer.
 F. Authenticator question, answer REPEAT answer.
 G. Authenticator question, answer REPEAT answer.
 H. Authenticator question, answer REPEAT answer.
 I. Height (inches or centimeters) weight (pounds or kilograms) color eyes, color hair.
 J. Authenticator question, number REPEAT number.
 K. Place of birth; city, state, country.
 L. Ten groups EEFI's identifiers. Begin with "ZZZZ", fingers are numbered 1 thru ten beginning with little finger of left hand thru little finger of right. End with "ZZZZ". Example Below:
 ZZZZ (Begin Print Data Indicator)
 MMAD 1st finger—finger loop—fourteen count.
 MMAG 2nd finger—finger loop—seventeen count.
 MMAE 3rd finger—finger loop—fifteen count.
 MMAD 4th finger—finger loop—fourteen count.
 MMAC 5th finger—finger loop—thirteen count.
 PPIJ 6th finger—finger missing—zero count.
 MMBA 7th finger—finger loop—twenty-one count.



NNAD 8th finger—thumb loop—fourteen count
 QQJJ 9th finger—finger mutilated—zero count
 QQBA 10th finger—finger mutilated—twenty-one count
 ZZZZ (End Print Data Indicator)
 M. Additional information

c. Example (PRINT)

Message number 12

Paragraph:

AAA SAMUEL MAT JONES
 BBB ONE FOUR JULY THREE SIX
 CCC UNIFORM SIERRA ALFA
 DDD UNIFORM SIERRA AIR FORCE
 EEE WIVES MIDDLE NAME XX FAY XXX FAY
 FFF FAVORITE STATE XX ANS XX IDAHO RPT IDAHO
 GGG FATHERS OCCUPATION XX ANS XX LAWYER RPT LAWYER
 HHH BOBS NICKNAME XX ANS XX BEER RPT BEER
 III SIX NINE INCHES SLASH ONE SEVEN THREE POUNDS SLASH BLUE SLASH BROWN
 JJJ SEVEN ONE SEVEN ONE RPT SEVEN ONE SEVEN ONE
 KKK BUCKEYE OHIO UNIFORM SIERRA ALFA
 LLL ZZZZ MMAD XX MMAG XX MMAE XX MMAD XX MMAC XX PPIJ XX MMBA XX NNAD XX QQJJ XX QQBA XX ZZZZ

Message Prepared for Encryption:

ONE TWO PRINT XX AAA SAMUEL MAT JONES BBB ONE FOUR JULY THREE SIX CCC UNIFORM SIERRA ALFA DDD UNIFORM SIERRA AIR FORCE EEE WIVES MIDDLE NAME XX ANSWER XX FAY XXX FAY FFF FAVORITE STATE XX IDAHO XXX IDAHO GGG FATHERS OCCUPATION XX ANSWER XX LAWYER XXX LAWYER HHH BOBS NICKNAME XX ANSWER XX BEER XXX BEER III SIX NINE INCHES XX ONE SEVEN THREE POUNDS XX BLUE XX BROWN JJJ SEVEN ONE SEVEN ONE XXX SEVEN ONE SEVEN ONE KKK BUCKEYE OHIO UNIFORM SIERRA ALFA

Cache Report (UNDER)

a. General:

(1) The Cache Report (UNDER) is issued by the outstations and the base station to report cache sites. The outstations will report cache of personnel records, intelligence documents, burial of personnel to the base station. The base station will report caches consisting of ammunition, demolitions, barrier items, weapons, etc., which have become known after outstation infiltration or which, because of security reasons, were not made known until supplies were needed by the outstation.

(2) The amount of information contained in the cache report must be consistent with the security restrictions on transmission times and minimum data required for recovery of the cache.

b. Format

Proword: UNDER

Paragraph:

- A. Type of cache (concealment/burial/submersion).
 B. Cache contents (identify the type and amount of supplies located in cache. The NANCY/MARGE BUNDLE CODE should be utilized if possible to report contents).
 C. Number of containers.
 D. Reference point.
 E. Cache location (describe location, give azimuth and directions from reference point. Give detailed description if necessary).
 F. Depth cache placed.
 G. Additional information.

c. Example (UNDER)

Message number 12

Paragraph:

AAA BURIAL
 BBB 2 MARGE & ALFA
 CCC 4
 DDD CHURCH BRAVO TANGO NINE ONE FIVE
 EEE 10 METERS BEHIND SHRINE FROM RP #15 DEGREES 150 METERS BEHIND ROAD. LARGE ROCK ON TOP OF CACHE
 FFF 15 FEET

Message Prepared for Encryption:

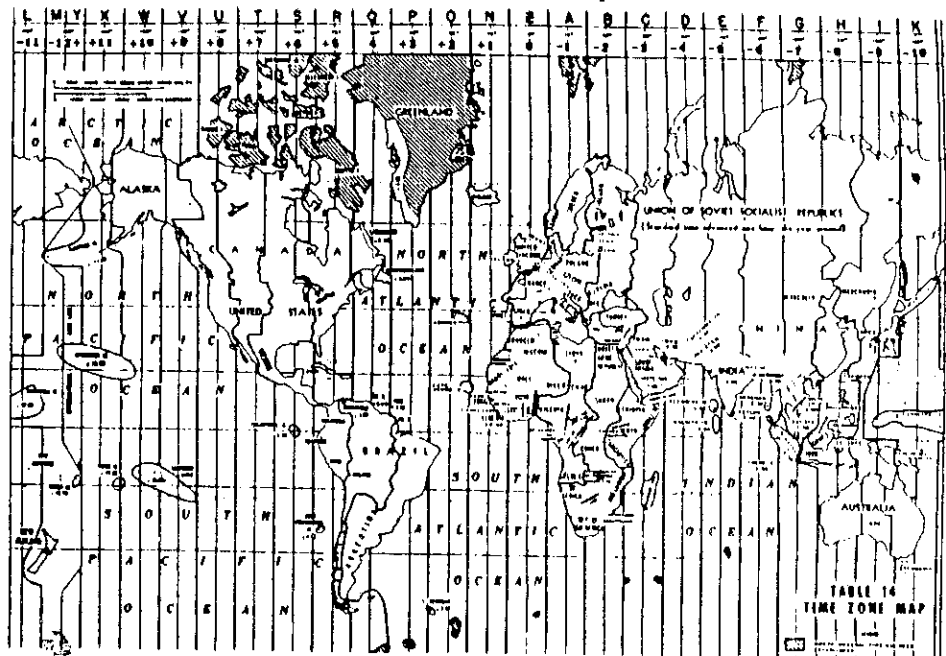
ONE TWO UNDER XX AAA BURIAL BBB TWO MARGE EIGHT ALFA CCC FOUR DDD CHURCH BRAVO TANGO NINE ONE FIVE ZERO SIX SEVEN EEE ONE ZERO METERS BEHIND SHRINE XX FROM ROMEO PAPA ZERO ONE FIVE DEGREES ONE FIVE ZERO METERS ALONG ROAD XX LARGE ROCK ON TOP OF CACHE FFF ONE POINT FIVE FEET

C. Trigraph

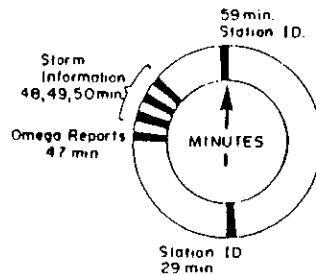
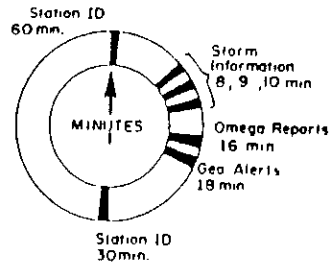
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	N	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z												
Z	Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
B	A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	O	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z												
Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	P	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z												
C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	P	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	Z	Q	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
D	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Q	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	Y	Z	Q	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
E	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	R	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	Y	Z	R	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
F	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	S	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	Y	Z	S	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
G	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	T	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
I	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	Y	Z	T	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
H	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	U	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	Y	Z	U	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
I	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	V	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
R	O	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	T	S	Y	Z	V	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
J	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	W	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
O	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	T	S	R	Y	Z	W	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
K	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	X	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	T	S	R	Q	Y	Z	X	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
L	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Y	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
O	N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	T	S	R	Q	P	Y	Z	Y	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										
M	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z											
N	M	L	K	J	I	H	G	F	E	D	C	B	A	Z	Y	X	W	V	U	T	S	R	Q	P	O	Y	Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z										



D. World Time Zone Map



WWV HOURLY BROADCAST FORMAT



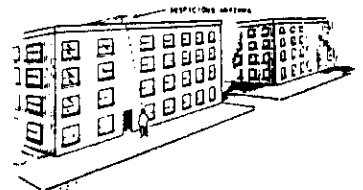
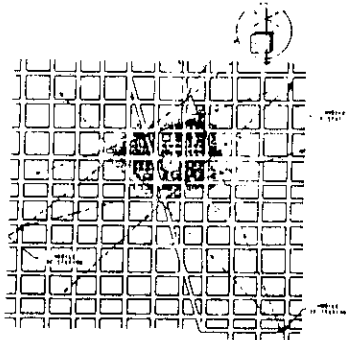
WWVH HOURLY BROADCAST FORMAT

E. World Time Frequency Stations

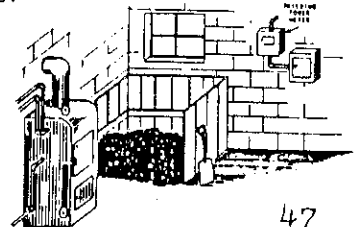
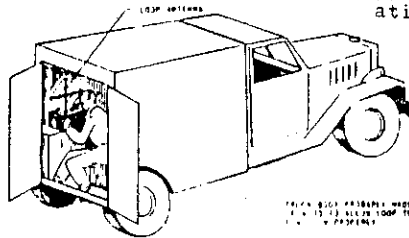
WORLD TIME- FREQUENCY STATIONS

NATION	CITY	CALL SIGN	FREQUENCY MHz
Argentina	Buenos Aires	LOL	5:10:15
Australia	Lyndhurst, Victoria	VNG	5:425:7:515-12:005
Canada	Ottawa	CHU	1:130:2:335-14:670
Czechoslovakia	Prague (Praha)	OMA	2:5
India	New Delhi	ATA	10
Japan	Tokyo	ITV	2:5:5:10:15
South Africa	Olifantfontein	ZUO	5:10
Switzerland	Neuchatel	HBN	5
United Kingdom	Rugby	MSF	2:5:5:10
U. S. A.	Ft. Collins, Co	WWV	2:5:5:10:15:20:25
U. S. A.	Kekaha, Hawaii	WWVII	2:5:5:10:15:20
U. S. S. R.	Moscow	RFS RWM	5:10:15

F. Precautions Against Radio Direction Finding.



- 1) Change operating frequencies often.
- 2) Change operating time.
- 3) Keep transmissions short.
- 4) Use horizontal antennas where possible.
- 5) Operate from thickly populated areas.
- 6) Located antennas well above street level.
- 7) Operate from batteries.
- 8) Change transmitter location as often as possible.
- 9) Avoid long tuneups and distinctive operating characteristics.



G.Morse Code Chart

A dideh --
 B dahdidit ---
 C dahridahdit ---
 D dahridit ---
 E dit --
 F dididahdit ---
 G dahdahdit ---
 H dididit ---

I didit --
 J didahdahdah ---
 K dahdah ---
 L didahdit ---
 M dahdah ---
 N dahit --
 O dahdahdah ---
 P didahdahdit ---
 Q dahdahdah ---
 R didahdit ---

S didit ---
 T dah ---
 U dididah ---
 V dididah ---
 W didahdah ---
 X dahdahdah ---
 Y dahdahdah ---
 Z dahdahdit ---

1 didahdahdahdah ---
 2 dididahdahdah ---
 3 didididahdah ---

4 didididididid ---
 5 didididididid ---
 6 dahdididididid ---
 7 dahdahdidididid ---

8 dahdahdahdidit ---
 9 dahdahdahdahdit ---
 0 dahdahdahdahdah ---

Break(BT): dahdididididid ---
 Repeat(IMI): dididahdahdidit ---
 Out(AR): didahdidahdit ---



48

NOTES