SIDEBAND EXCITER CMR-4

A-1. INTRODUCTION

The Sideband Exciter, Model CMR-4 is similar to the CMRA-1. The technical manual for the Sideband Exciter, Model CMRA-1 will apply to the CMR-4 when the additions, deletions and corrections outlined in this addendum have been incorporated. All references to CMRA-1 within the technical manual will then apply to the CMR-4.

The modifications fall into specific categories, and each category is covered separately in this addendum. A general description of each modification is given. Additionally, the effect of the modification on particular sections of the technical manual is discussed and an engineering drawing of the modification is provided. The CMR-4 includes a keying MODE switch (S1005), which provides a choice of keying sources. Both terminal board TB1002 and relay K1002 (formally used to trigger an external alarm and/or indicator in the presence of audio input) are now modified, and relabelled for use with the MODE switch. Alarm circuitry has been deleted in the CMR-4.

A-2. TB1002

Terminal board TB1002 is mounted on the lower rear panel of the CMR-4. TB1002 is an 18-terminal barrier-type strip; however, connections are made only to terminals 3 thru 10, inclusive. The remaining terminals are not connected. TB1002 terminal connections (via front-panel MODE switch) are outlined in Table 1. When the CMR-4 is used with a suitable external translator (such as TMC model CHG-4) having external keying inputs, the external translator will key with the CMR-4, by means of an interconnecting cable between appropriate terminals of TB1002 and the translator itself.

A-3. K1002

Relay K1002 is mounted within the main chassis of the CMR-4, and operates in conjunction with the MODE switch S1005 and Logic card Z1002. K1002 is energized via a ground supplied by the Logic card, in the presence of suitable audio input to the CMR-4. K1002 closure causes TB1002 terminal 8 to be grounded, when the MODE switch S1005 is in the VOX position. External equipment, therefore, will key with K1002 as noted in paragraph A-2 above.

A-4. S1005

The MODE switch S1005 provides the various enabling and disabling of circuitry required for specific modes. The MODE switch also provides interconnect between the appropriate terminals of TB1002, such that proper

mode switching and keying occurs in both the CMR-4 and the associated external equipment. Table 2 shows the various TB1002 switching functions that occur in each position of S1005. Note that Table 1 treats the interconnects in terms of individual TB1002 terminals, whereas, Table 2 approaches the TB1002 terminal functions in terms of S1005 position.

Figure 1 is a simplified schematic diagram depicting MODE switch connections to TB1002, and also depicting TB1002 connections to an external frequency translator (in the case of Figure 1, TMC Model CHG-4).

TABLE 1. TB1002 TERMINAL CONNECTIONS

TB1002 Term.	FUNCTIONS
3	ground
4	to external PTT contacts (connect to term 3 for keying).
5	internally connected to term. 6 in PTT, VOX, and NORM positions of MODE switch for external equipment keying (eg. CHG-4).
6	internally connected to term. 5 in PTT, VOX, and NORM positions of MODE switch; in CW position of MODE, routed thru a blocking diode to term. 9 for eventual ground thru external CW hand key.
7	internally connected to term. 8 in CW position of MODE switch; also routed thru a blocking diode to term. 9 (CW) in all modes, for eventual ground thru a CW hand key.
8	CW pos: internally connected directly to term. 7; also connected to term. 9 (CW) thru blocking diode. PTT pos: connected directly to term. 4 (PTT) via MODE switch. VOX pos: routed to pin 6 of relay K1002; grounded upon VOX actuation. NORM pos: routed directly to ground, for direct actuation of external equipment.
9	to external CW hand key (short to term. 10 for keying).
10	ground

TABLE 2. S1005 FUNCTIONS

S1005 positions	TB1002 terminal	Connected to	TB1002 terminal
CW	3		ground
	4		open
	5		open
	6		9, thru blocking diode.
	7		9, thru blocking diode.*
	8		7, directly; therefore, to 9, thru diode.
	9		6, 7 as above.
	10		ground
* isolated from term. 6 by diode.			
PTT	3		ground
	4		8, directly
	5		6, directly
	6		5, directly
	7		9, thru blocking diode.
	8		4, directly
	9		7, thru blocking diode.
	10		ground
VOX	3		ground
	4		open
	5		6, directly
	6		5, directly
	7		9, thru blocking diode.

TABLE 2. S1005 FUNCTIONS (cont'd)

S1005 positions	TB1002 terminal	Connected to	TB1002 terminal
VOX	8		pin 6 of K1002 relay (gnd upon actuation)
	9		7, thru blocking diode.
	10		ground
NORM	3		ground
	4		open
	5		6, directly
	6		5, directly
	7		9, thru blocking diode.
	8		ground, directly
	9		7, thru blocking diode.
	10		ground

A-5. ALIGNMENT

Paragraph 5-4, Alignment, page 5-7, change NOTE to read as follows:

> "The alignment procedure must be performed with the MODE switch in NORMAL position and must be performed in the order given. All printed circuit cards must be energized. If trouble is experienced at any step during the alignment procedure, the trouble must be located and corrected before proceeding to the next step."

A-6. PARTS LIST

In Section 6 of the CMRA-1 technical manual the following additions, corrections and deletions should be made so that it will be applicable to the CMR-4.

Delete in entirety the following components:

CR1006 thru CR1008, K1001, L1039 thru L1041, R1017, and XK1001.

Change the descriptions and part numbers of the components listed to read as follows:

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C531	Capacitor, Fixed, Mica Dielectric, 220 uuf, ±5%, 500 WVDC, straight wire leads	CM11F221J5S
Q508	Transistor	2N3646
Q509 thru Q511	Same as Q501	
R502	Resistor, Fixed, Composition, 3.9 ohms, ±5%, 1/4 watt	RC07GF3R9J
R514	Resistor, Fixed, Composition, 220 ohms, ±5%, 1/2 watt	RC20GF221J
R519	Resistor, Fixed, Composition, 5600 ohms, ±5%, 1/2 watt	RC20GF562J
R537	Resistor, Fixed, Composition, 6800 ohms, ±5%, 1/2 watt	RC20GF682J
R540	Resistor, Fixed, Composition, 680 ohms, ±5%, 1/2 watt	RC20GF681J
R541	Same as R540	
R546	Same as R540	
C619	Capacitor, Fixed, Mica Dielectric, 8200 uuf, ±1%, 100 WVDC, straight wire leads	CM112F822F1S
Q602	Transistor	2N3646
Q603 thru Q610	Same as Q601	
C703	Capacitor, Fixed, Mica Dielectric, 12 uuf, ±10%, 500 WVDC, straight wire leads	CM11C120K5S
C1012	Capacitor, Fixed, Button Mica Dielectric, 1000 uuf, ±10%, 300 WVDC, 1 single U type terminal	CB21Q102K
C1013	Same as C1012	

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1014	Same as C1012	
C1015 thru C1023	Not Used	
C1024 thru C1042	Same as C1012	
CR1004	Semiconductor, Device Diode	1N39A
CR1005	Same as CR1004	
J1001	Connector, Receptacle, Electrical	JJ293-22SFE
L1013	Same as L1011	
L1014 thru L1022	Not Used	
S1003A,B	Switch, Rotary, 2 sections, 6 positions	SW217
S1005	Switch, Rotary	SW520

Add the following components:

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
CR701	Semiconductor, Device Diode	1N961B
CR702	Same as CR701	
R726	Resistor, Fixed, Composition, 100 ohms, ±5%, 1/2 watt	RC20GF101J
R727	Same as R726	
L1043 thru L1045	Same as L1011	

A-7. SCHEMATIC DIAGRAM CHANGES

(1) Figure 7-1, Schematic Diagram, CMRA-1 (page 7-3/7-4), remove and replace with attached new Figure 7-1 (Schematic Diagram CMR-4).

(2) On Figure 7-2, page 7-5/7-6 make the following changes:

Change the value of C31 from 180 to 220 pf.
Change the part number of Q8 from 2N706 to 2N3646.
Change the value of R2 from 27 to 3.9.

(3) On Figure 7-3, page 7-7/7-8 make the following change:

Change the value of C19 from 10,000 to 8200.

(4) On Figure 7-5, page 7-11/7-12 make the following changes:

Change the value of C3 from 18 to 12.
Change the value of R24 from 330 to 220.

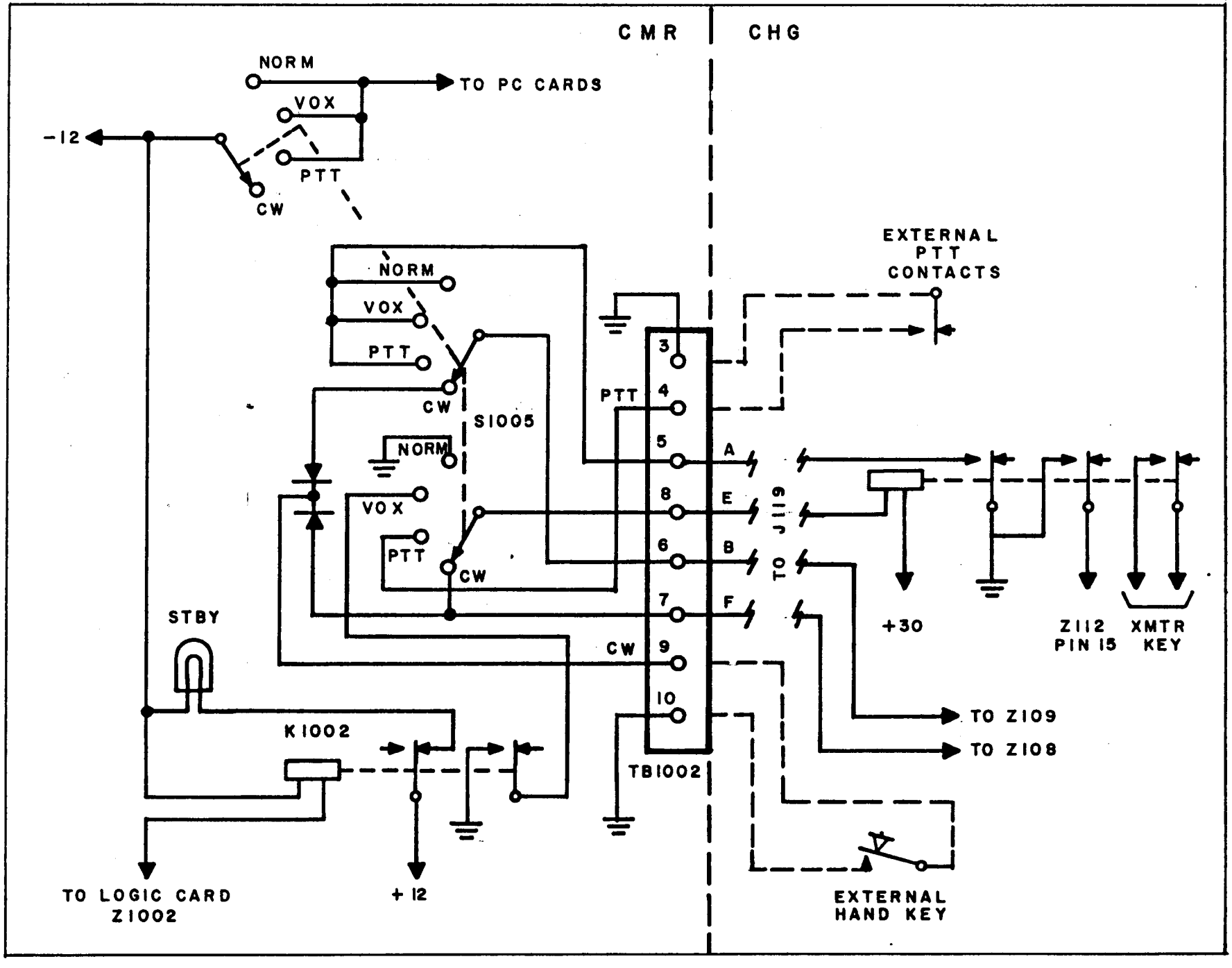

FIGURE 1 SIMPLIFIED SCHEMATIC, CMR 4 MODE SWITCH CONNECTIONS