

4.1 WIRING THE M-FUNCTION CABLE

The M-function cable contains 15 #22 AWG color coded conductors and is used to provide input signals to the ATC as well as to transmit signals from the ATC to the external device. Each conductor is assigned for a specific function.

In addition to the eight input functions (tool-in, etc.), the cable is also used to transfer from the ATC logic to the external device the following signals:

- a. Reset signals that the input function is complete.
- b. +12 volt DC to the switching device within the external controller
- c. A SLIDE HOLD INTERLOCK signal that air pressure is applied to keep the claw open.

Figure (3.4) shows the M-function cable and how it is connected to the ATC.

Using Figure (3.4) lets simulate a tool-out function in the AUTO mode. The external controller must contain a switching device which will close when a command is given to the controller to perform tool-out. The switching device will then connect or tie the green wire with the violet wire. Voltage will be applied from the violet wire through the green wire of the M-function cable to the logic circuits of the tool changer. The switching device must remain closed so voltage will continue to be applied through this wire until the tool-out function is complete. When tool-out is complete, the tool changer returns a reset signal to the external controller by closing the white/black and gray wires for a duration of approximately 100 milli-seconds. When the external controller receives the reset signal, the controller must immediately "Open" the switching device that connected the green to the violet wire to accomplish the tool-out function.

4.2 M-FUNCTION COMMANDS

In the above discussion of the M-function cable, we simulated a tool-out function. It is necessary that the external control be told specifically that it should only close the tool-out circuit.

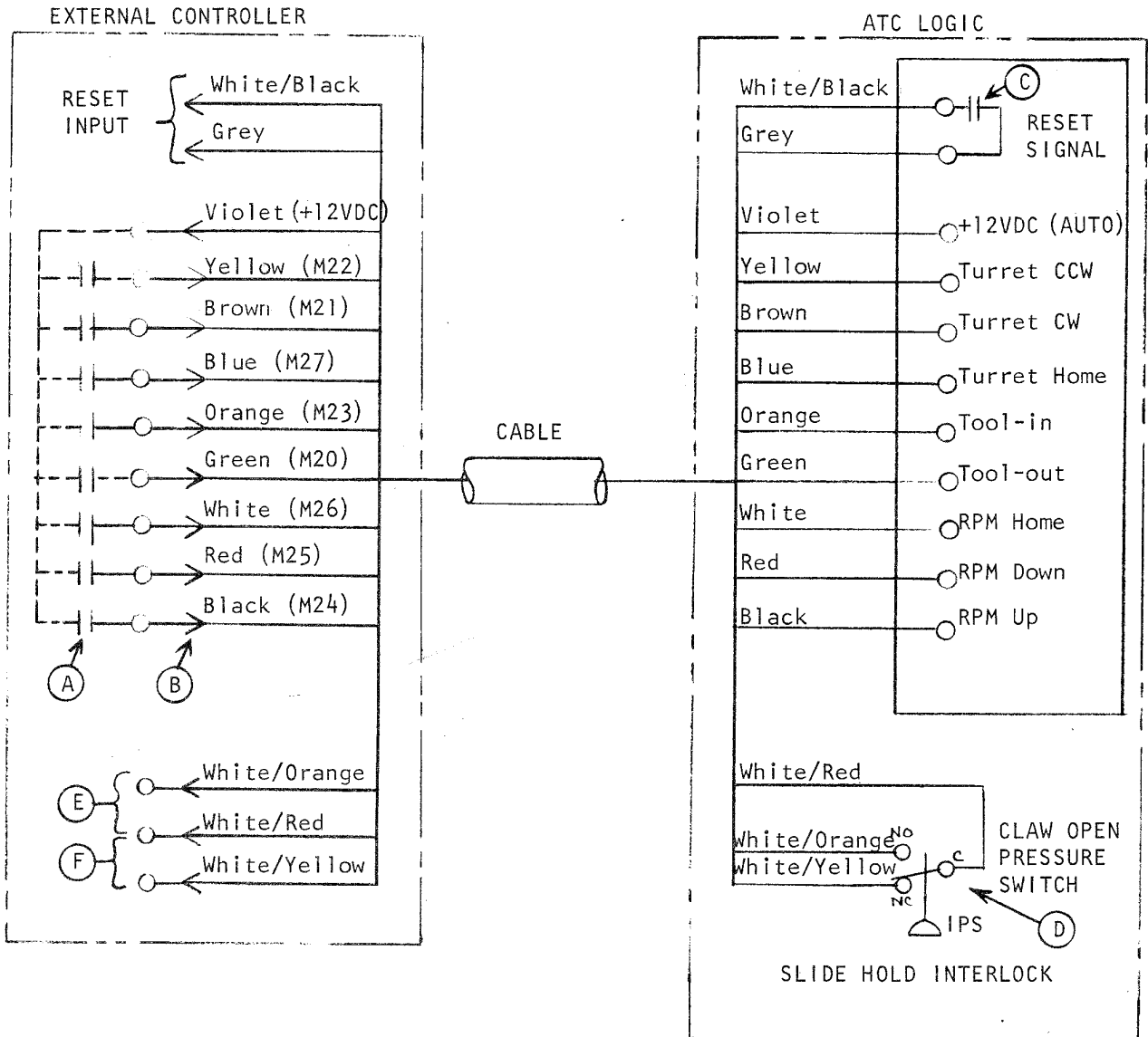
Therefore, we need to assign specific miscellaneous function commands to the individual circuits used by the ATC.

Summit/Dana has selected the M-20 series of commands in order to provide a standard for a discussion of tool changer functions.

The function and the associated wire color code are as follows:

M20 - Tool-out	Green	M24 - RPM Up	Black
M21 - Turret CW	Brown	M25 - RPM Down	Red
M22 - Turret CCW	Yellow	M26 - RPM Home	White
M23 - Tool-in	Orange	M27 - Turret Home	Blue

M-FUNCTION CABLE
FIGURE 3.4



NOTES:

- A. CUSTOMER SWITCHING DEVICE (contact closure)
- B. M-FUNCTION COMMAND OUTPUT TO ATC
- C. INTERNAL RESET SIGNAL FROM ATC - 100 msec contact closure
- D. ATC INTERNAL PRESSURE SWITCH FOR SLIDE HOLD - an output to controller
- E. A N.O. CONTACT - closes when air pressure is applied to open claw
- F. A N.C. CONTACT - opens when air pressure is applied to open claw